Performance Analysis
of
Price Anderson Amendment Act (PAAA) Non-Compliance Tracking System (NTS) and Occurrence Reporting and Processing System (ORPS) Reportable Incidents
Fiscal Year (FY) 2007 4th Quarter
(October 1, 2006 – September 30, 2007)

Report No. 16

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INTRODUCTION

As part of its oversight program required by DOE Order 226.1, *Implementation of Department of Energy Oversight Policy*, LBNL identifies operational events, accidents and injuries in order to analyze and trend incidents to determine areas of needed improvement and to ensure the effectiveness of corrective actions to mitigate events and identify recurring events. The Occurrence Reporting Process System (ORPS) performance analysis satisfies the quarterly analysis and trending requirement in DOE Order 231.1A, *Environment, Safety, and Health Reporting*.

This analysis report addresses PAAA NTS- and ORPS-reportable incidents that were identified through the FY07 4th Quarter reporting period, which is defined as October 1, 2006 through September 30, 2007. Hereafter, any reference to the "FY07 4th Quarter reporting period" or "current reporting period" means October 1, 2006 through September 30, 2007.

ANALYSIS METHODOLOGY

The methodology for data analysis of Price Anderson Amendment Act (PAAA) Non-Compliance Tracking System (NTS) - and ORPS-reportable incidents based on the requirements outlined in LBNL/PUB-5519 (3), *Data Monitoring and Analysis Program Manual*, which is part of the institutional Issues Management Program. The Issues Management Program satisfies the data analysis requirements outlined in DOE O 226.1, *Implementation of Department of Energy Oversight Policy*, and DOE O 231.1A, *Environment, Safety and Health Reporting*, to identify recurring events and prevent more serious events from occurring.

Data analysis reports will be in graphical format, typically runs charts, controls charts and/or Pareto charts in accordance with LBNL/PUB-5519 (3) and will include the analysis of the data for the specified reporting period. This methodology is consistent with the guidance outlined in DOE G 231.1-1, *Occurrence Reporting and Performance Analysis Guide*, Attachment 6, *ORPS Performance Analysis Analytical Techniques*.

Statistical industry standards will be used to identify trends, adverse or otherwise, when analyzing ORPS and PAAA NTS reportable incidents. Based on an existing or potential trend, additional data will be monitored and analyzed to determine the cause of the trend, identify recurring events, and identify adverse conditions that require corrective actions, as applicable.

A statistical trend is defined as:

- One point outside the control limits;
- Two out of three points two standard deviations above or below the baseline average;
- Four out of five points one standard deviation above or below the baseline average;
- Seven points in a row above or below the baseline average; or
- Seven points in a row that are increasing or decreasing

The control chart is used to determine if the number of ORPS- and PAAA NTS-reportable incidents is within an acceptable statistical threshold and if statistical trends are present.

A recurring issue is when the same or similar issue occurs multiple times and indicates that the corrective actions developed and implemented do not adequately address the cause of the issue.

Pareto charts further break down the data by looking at various combinations of source data to determine the major contributions, the distribution of the contributors, and recurring issues. The cumulative data are reviewed, as appropriate, by:

- Trend Code, identified in Attachment 2, which will reveal common causes in dissimilar events
- Division, the organization that contributed to the event/incident

- Report type, ORPS or PAAA NTS
- Subject matter, the primary focus of the event/incident
- Circumstances surrounding the event/incident

This report will typically display the Pareto chart by trend code. The data that contributes to the majority of the instances in a particular trend code is then reviewed for commonalities. Additional Pareto charts will be included, if warranted. If a potential issue is identified during analysis of the data, the appropriate management and Subject Matter Experts (SMEs) will be contacted.

When statistical analysis and distribution analysis indicate the possibility of a recurrent event, the Office of Contract Assurance (OCA) reviews the subject events with the SMEs.

Where incidents are required to be reported to more than one reporting system, they are counted as only one incident. For example, an incident that is ORPS- and PAAA NTS-reportable is considered only one incident even though it was required to be reported to two systems.

EXECUTIVE SUMMARY

During the FY07 4th Quarter reporting period, 32 incidents were analyzed, ten PAAA NTS-reportable incidents and 26 ORPS-reportable incidents. Six of these incidents were found to be both PAAA NTS- and ORPS-reportable incidents. Therefore, these six incidents were counted only once, resulting in the actual number of incidents totaling 26.

During the FY07 3rd Quarter reporting period (June 1, 2006 – July 30, 2007) analysis of ORPS-reportable incidents determined the existence of an adverse statistical trend. Pareto chart analysis and ORPS criteria for recurring issues was used to identify a recurring electrical issue, which resulted in the generation of ORPS Category R (Recurring Occurrences) report SC-BSO--LBL-EHS-2007-0005 in August 2007.

While no additional statistical trend was identified during the FY07 4th Quarter reporting period, Pareto chart analysis and ORPS criteria for recurring issues was used to identify that eight of the 26 ORPS incidents directly involved subcontractors, indicating evidence of a recurring problem specific to subcontractor management.

This analysis has been discussed with the appropriate Subject Matter Experts (SMEs) and the LBNL ORPS Coordinator, and LBNL will generate an ORPS Category R (Recurring Occurrences) report to address subcontractor management.

Additionally, a detailed review of the ORPS reports indicates a potential issue regarding penetration permit violations, which warrants continued monitoring.

1.0 ORPS REPORTABLE INCIDENTS

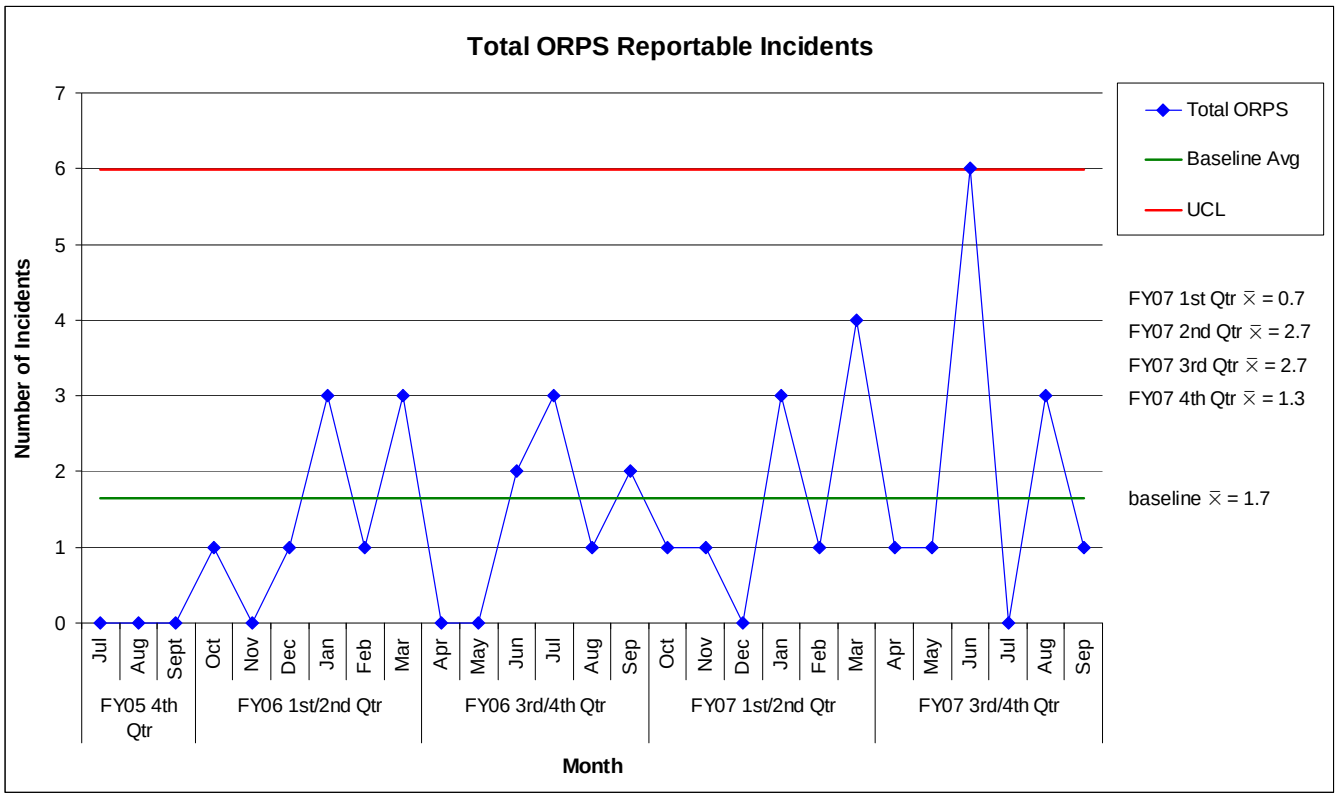

Figure 1.1

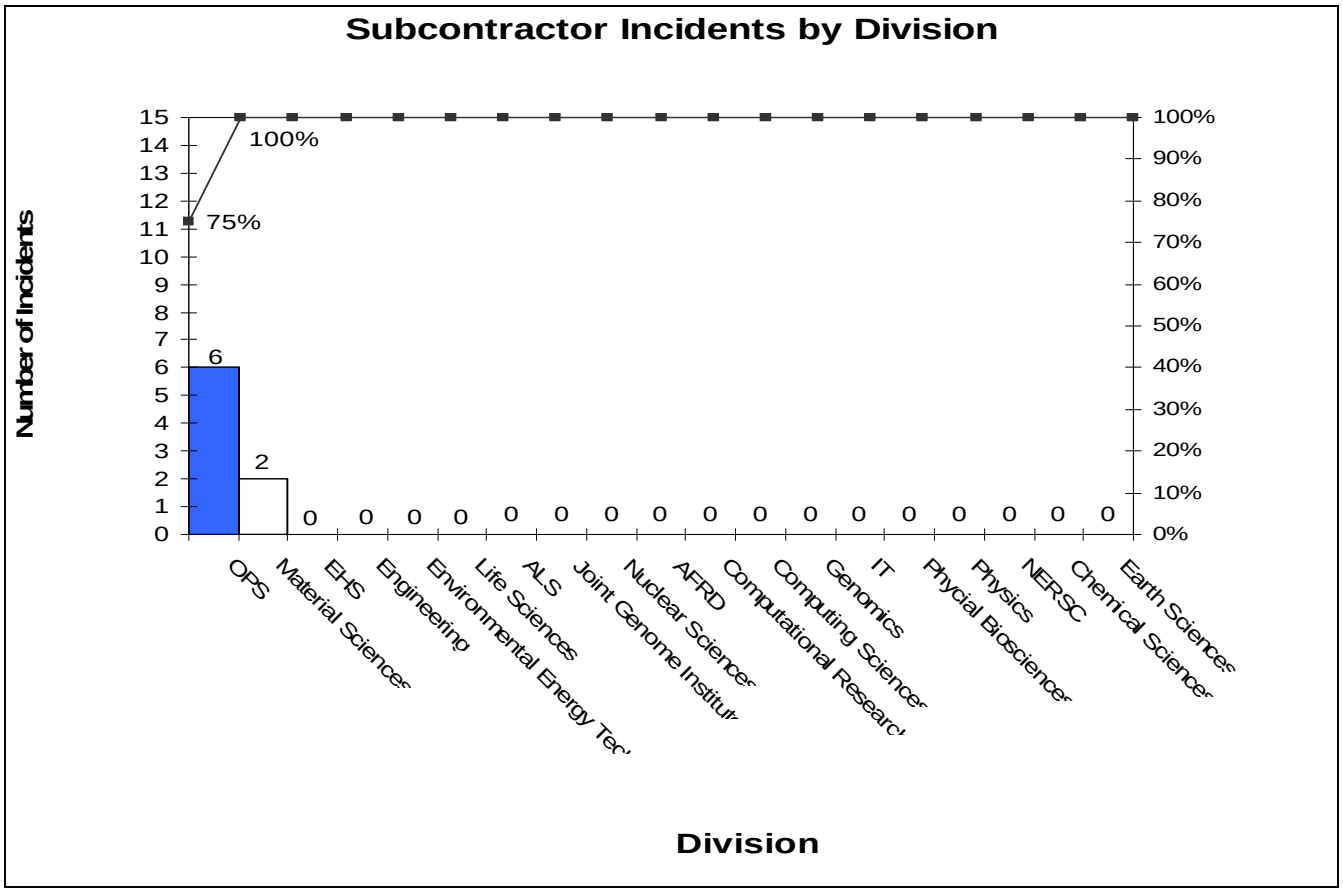

Figure 1.2

Analysis:

The total number of ORPS reports during FY07 4th Quarter reporting period is 26, an increase from the 24 reports identified during the FY07 3rd Quarter reporting period (June 1, 2006 - July 31, 2007).

Figure 1.1 identifies the upper control limit (UCL), which is three standard deviations above the baseline mean, 5.99. In June 2007, an adverse statistical trend was detected when the number of incidents exceeded the UCL. Analysis of the data determined that a recurring electrical problem existed, for which ORPS Recurring Report SC-BSO--LBL-EHS-2007-0005 was generated. No other statistical trends are identified.

Analysis of the ORPS reports from the past twelve months indicates that there is evidence of a recurring issue specific to subcontractor management. This determination was based on the following ORPS criteria for recurring issues:

1) A significant number or percentage of implementation failures indicate that one or more components of a program were not effective in ensuring successful completion of a task or activity.
2) Common underlying causes or weakness in controls have necessitated corrective actions.
3) Multiple control failures within the boundaries of a single occurrence have taken place indicating a common breakdown in a program or area of a program.

During the current reporting period, eight (31%) of the 26 ORPS reports generated directly involved subcontractors: SC-BSO--LBL-OPER-2006-0007 (November 2006); SC-BSO--LBL-OPER-2007-0001 (January 2007); SC-BSO--LBL-OPER-2007-0002 (March 2007); SC-BSO--LBL-OPER-2007-0003 (March 2007); SC-BSO--LBL-MSD-2007-0002 (April 2007); SC-BSO--LBL-OPER-2007-0004 (June 2007); SC-BSO--LBL-MSD-2007-0003 (August 2007); and SC-BSO--LBL-OPER-2007-0008 (September 2007).

Common causes shared among the incidents include “division” and “trend code”. As shown in the Pareto Chart (Figure 1.2), the majority of these eight incidents (75%) were contributed by the Operations organization, which reflects the fact that the majority of subcontractors are managed by Operations. Four were assigned the trend code “A. Policy/Procedures/Instructions Not Used”.

With regard to the common cause of “division”, the remaining two incidents were contributed by the Materials Sciences Division (MSD), regarding the mercury spill and containment and electrical Lockout/Tagout (LOTO). With regard to the common cause of “trend code A.”, the remaining four incidents were distributed across trend code “H. Work Planning Needs Improvement/Less than Adequate”, “B. Policies/Procedures/Instructions Used Incorrectly”, and “I. Work Processes/Packages Need Improvement/Less than Adequate”.

Detailed review of the ORPS reports helped to identify a potential issue regarding penetration permit violations, which warrants continued monitoring. Corrective actions have been developed and implemented to address these issues. An Effectiveness Review of these corrective actions will be performed in December 2007 to determine if the causes of the issues have been effective in preventing the recurrence of the same or similar issues.

2.0 PAAA NTS REPORTABLE INCIDENTS

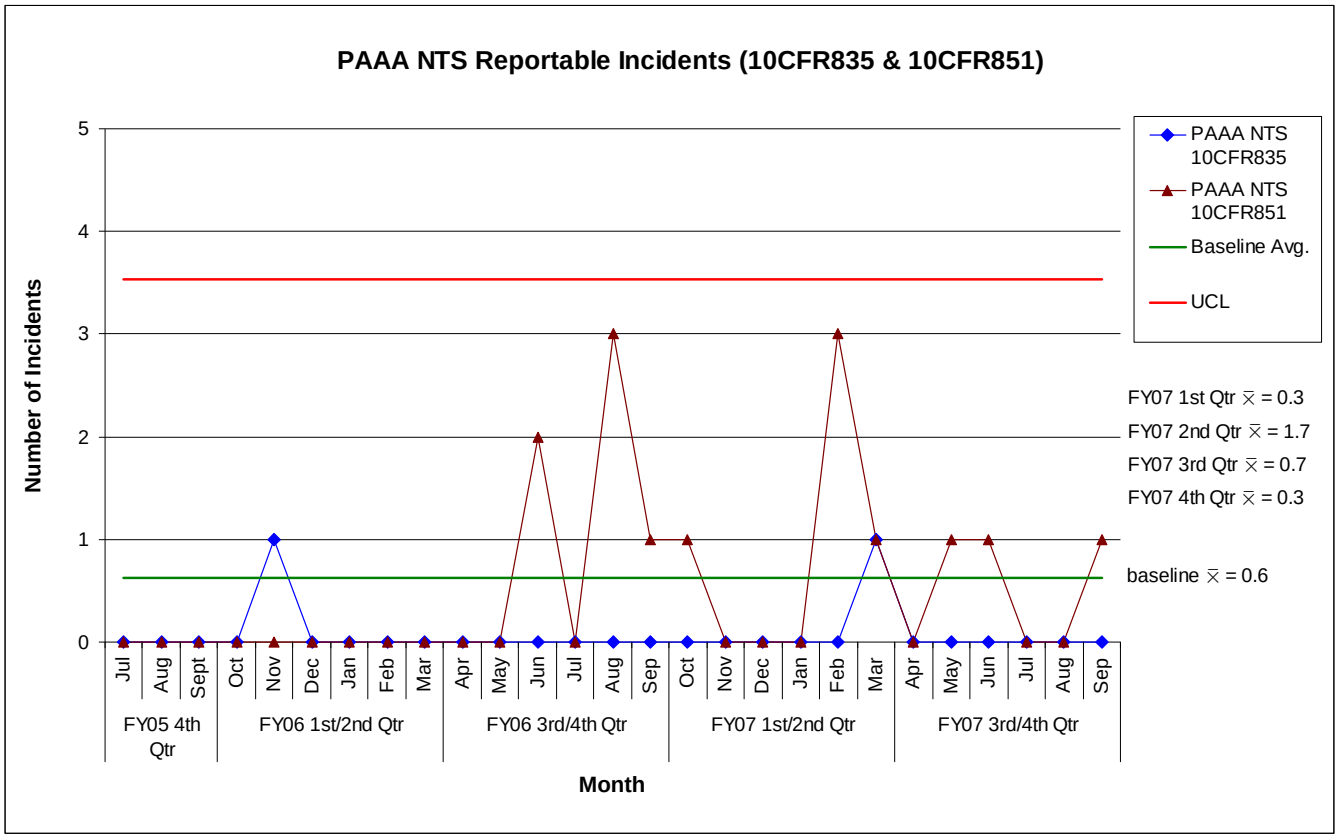

Figure 2.1

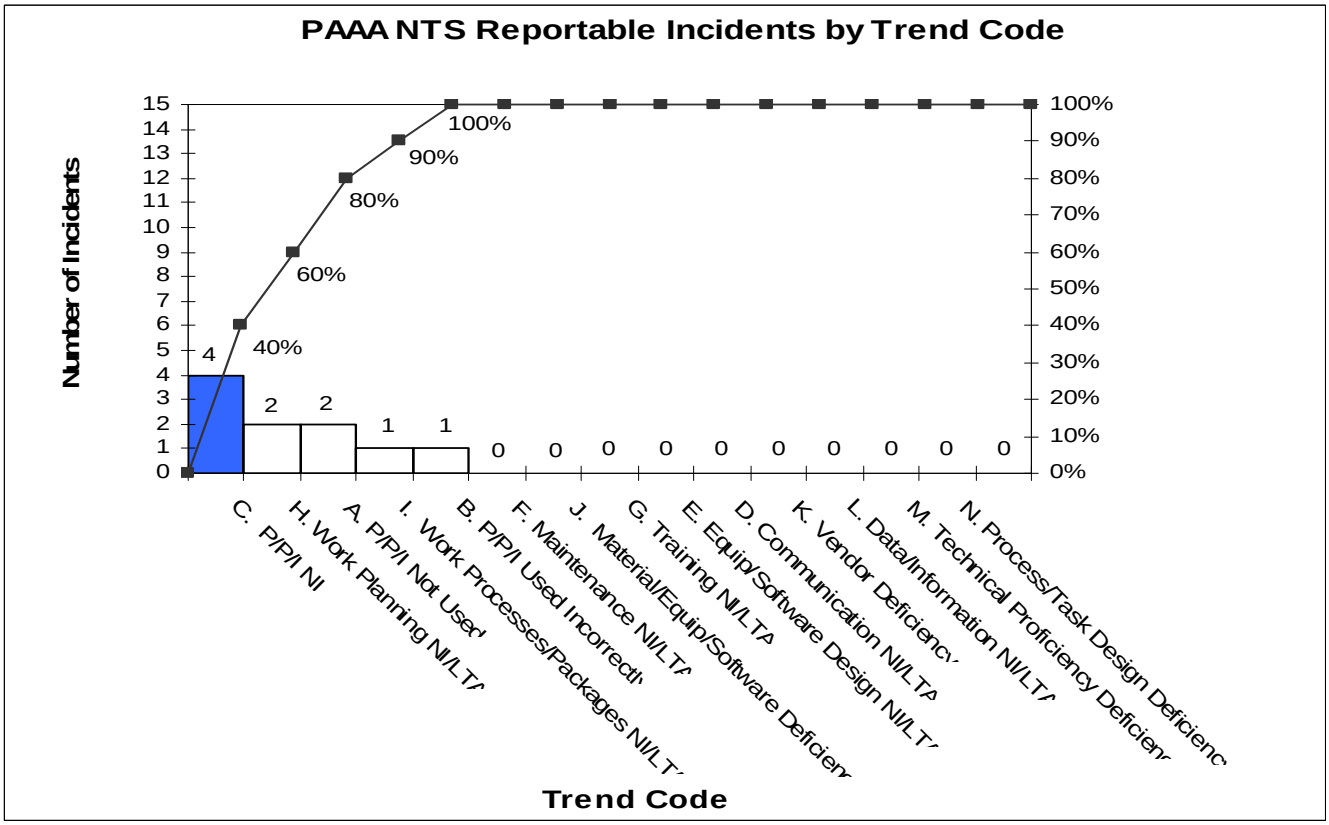

Figure 2.2

Analysis

While represented on Figure 2.1, six 10CFR851 PAAA NTS Reportable Incidents are duplicates of ORPS reportable Incidents. (See Attachment 1 for details on duplicate incidents.) The 10CFR851 NTS-reportable incident identified in August was specific to the mercury spill at the Molecular Foundry. Based on the statistical analysis, it has been determined that no statistical trend for the FY07 4th Quarter reporting period exists among PAAA reports.

Figure 2.2 indicates the four incidents are categorized as trend code; “C. Policies/Procedures/ Instructions Need Improvement”. Two of these incidents were specific to electrical safety. One was regarding the lack of Electrical and the other was the lack of an Electrical Authority Having Jurisdiction. There were no commonalities shared by these two incidents outside of the general subject matter. The other two incidents were specific to the lack of a Job Hazard Analysis program and penetration permit violations. Review of the division, subject matter, and circumstances determined that no evidence of a recurring issue exists in this area.

3.0 ORPS AND PAAA NTS REPORTABLE INCIDENTS

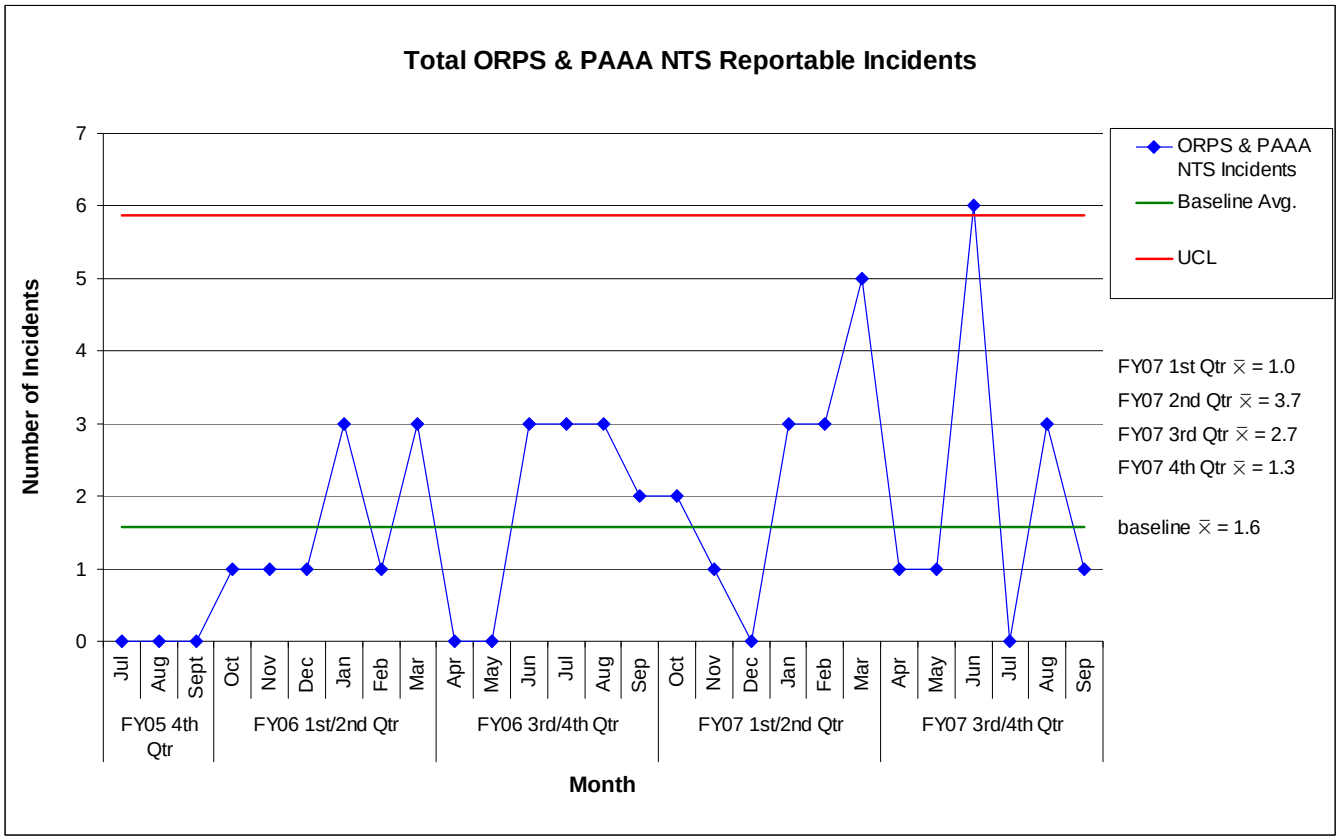

Figure 3.1

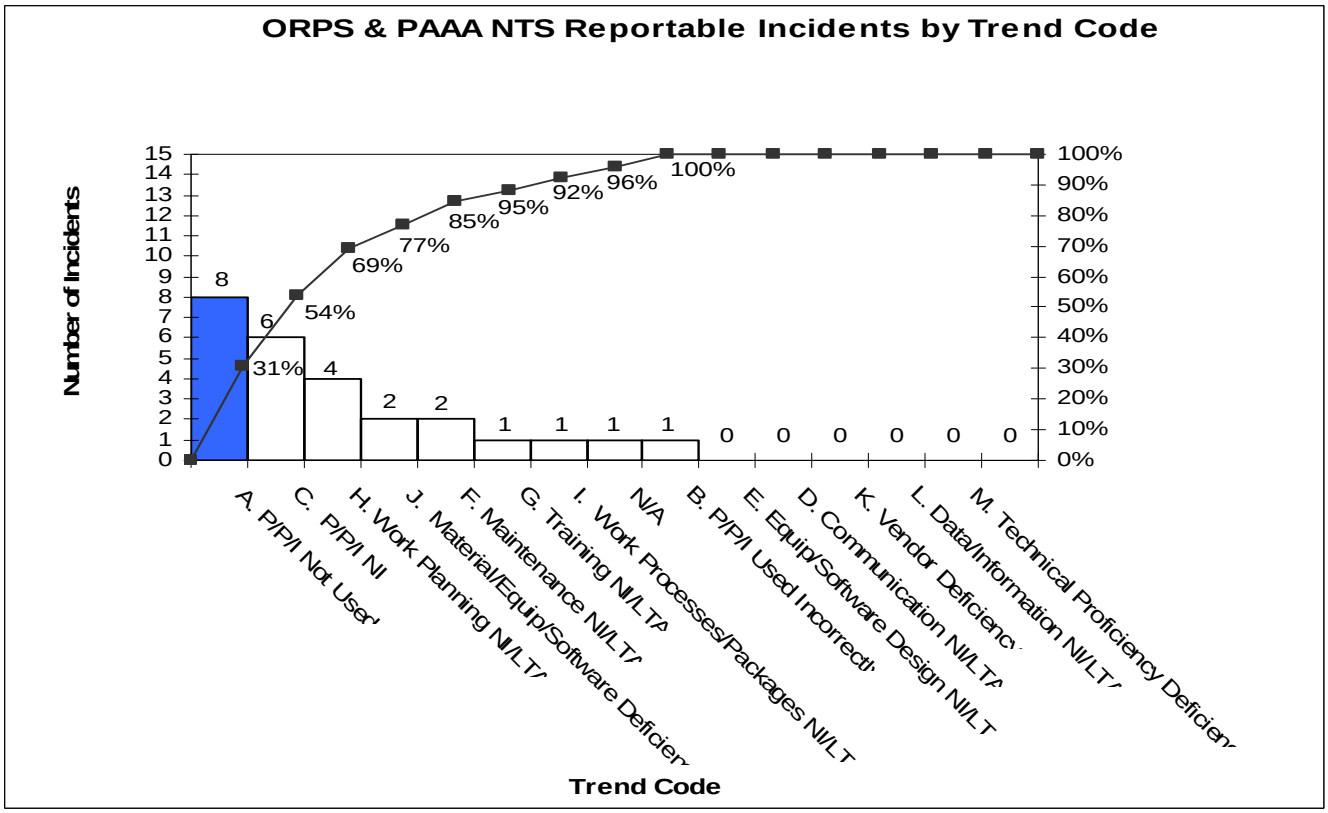

Figure 3.2

Analysis:

During this reporting period, six ORPS and PAAA NTS-reportable incidents were duplicated. (See Attachment 1 for details on duplicate incidents.) The number of total incidents increased from 24 to 26 from the FY07 3rd Quarter reporting period (June 1, 2006 – July 30, 2007) to the FY07 4th Quarter reporting period.

Figure 1.1 identifies the upper control limit (UCL), which is three standard deviations above the baseline mean, 5.87. In June 2007, an adverse statistical trend was detected when the number of incidents exceeded the UCL. Analysis of the data determined that a recurring electrical problem existed, for which ORPS Recurring Report SC-BSO--LBL-EHS-2007-0005 was generated. No other statistical trends are identified.

The Pareto Chart indicated that eight of the incidents were categorized as trend code "A. Policy/ Procedures/Instructions Not Used". Three of these incidents were specific to notices of violation from external regulatory agencies, which differ with regard to circumstances. The incidents were specific to shipment of hazardous waste from an onsite to offsite location without a manifest, medical waste and container requirements noncompliances, and training in accordance with the RCRA Permit. Three of these incidents were specific to permit penetration violations. These incidents were regarding anchoring/installing fixtures in concrete slabs without an approved permit and contrary to the permit specifications, using an excavator to locate the end of an oil pipe, which resulted in the concrete cap being broken causing oil to leak into the ground. The other two incidents share no commonalities.

Analysis of the ORPS reports from the past twelve months indicates that there is evidence of a recurring problem specific to subcontractor management. During the current reporting period, eight of the 26 ORPS reports generated (31%) directly involved subcontractors. Details regarding this recurring issue are found in the “Analysis” portion of Section 1.0.

ATTACHMENT 1 – ORPS AND PAAA NTS REPORTABLE INCIDENTS FOR OCT 06 – SEPT 07

Item	Title	Report #	FY	Disc. Date	PAAA Duplicates
1.	Employee suicide/fall from upper floor	ORPS: PHY-06-01	FY06	18-Oct	
2.	Fall Protection Program LTA	NTS: EHS-06-07	FY07	6-Oct	
3.	Management Concern due to Penetration Permit Incidents	ORPS: OPER-06-07	FY07	29-Nov	NTS: EHS-06-03
4.	Discovery of suspect/counterfeit pipe fittings and steel pipe	ORPS: OPER-07-01	FY07	18-Jan	
5.	Potential Exposure to Nitric and Hydrofluoric Acid Vapor	ORPS: MSD-07-01	FY07	23-Jan	
6.	B58A-102 ground penetration permit administrative error	ORPS: ENG-07-01	FY07	30-Jan	
7.	Electrical Equipment AHJ Approval Program (NEC 110.2) LTA	NTS: EHS-07-02	FY07	6-Feb	
8.	Job Hazard Analysis (JHA)Program Implementation LTA	NTS: EHS-07-01	FY07	23-Feb	
9.	Building 88 Vault 115volt electrical shock	ORPS: ENG-07-02	FY07	26-Feb	NTS: EHS-07-03
10.	Use of Non-DOELAP Dosimeter	NTS: EHS-07-04	FY07	7-Mar	
11.	LOTO violation results in near miss	ORPS: OPER-07-02	FY07	23-Mar	NTS: EHS-07-05
12.	Class II Violations of RCRA Part B Permit	ORPS: EHS-07-01	FY07	27-Mar	
13.	DTSC consent order/ fines	ORPS: EHS-07-02	FY07	29-Mar	
14.	Management Concern for Penetration Permit Violation	ORPS: OPER-07-03	FY07	30-Mar	
15.	Management concern involving vendor working on electrically energized equipment	ORPS: MSD-07-02	FY07	6-Apr	
16.	Employee broke leg falling off personal transporter (Segway)	ORPS: EHS-07-03	FY07	18-May	
17.	B71 Lead Air Sample Level Exceeds OSHA limit	ORPS: OPER-07-04	FY07	4-Jun	NTS: EHS-07-06
18.	Department of Health Services Notice of Violations	ORPS: EHS-07-04	FY07	14-Jun	
19.	Sanitary sewer overflow (SSO) on site	ORPS: OPER-07-05	FY07	25-Jun	
20.	Sanitary sewer overflow (SSO) on site	ORPS: OPER-07-06	FY07	26-Jun	
21.	Employee slipped and fell on wet floor	ORPS: LSD-07-01	FY07	27-Jun	
22.	Student assistant received electrical shock	ORPS: EETD-07-01	FY07	29-Jun	NTS: EHS-07-07
23.	AA Lithium iron battery exploded	ORPS: OPER-07-07	FY07	3-Aug	
24.	Recurrent Electrical Safety Issues	ORPS: EHS-07-05	FY07	9-Aug	
25.	Mercury Spill at Molecular Foundry	ORPS: MSD-07-03	FY07	20-Aug	NTS: EHS-07-08
26.	Underground Pipe Plug Broken by Excavator During Demolition Operation	ORSP: OPER-07-08	FY07	7-Sept	

ATTACHMENT 2 – TREND CODES

Trend Code
A. Policies/Procedures/Instructions Not Used
B. Policies/Procedures/Instructions Used Incorrectly
C. Policies/Procedures/Instructions Need Improvement
D. Communication Needs Improvement /Less Than Adequate
E. Equipment/Software Design Needs Improvement /Less Than Adequate
F. Maintenance Needs Improvement /Less Than Adequate
G. Training Needs Improvement /Less Than Adequate
H. Work Planning Needs Improvement /Less Than Adequate
I. Work Processes/Packages Need Improvement /Less Than Adequate
J. Material/Equipment/Software Deficiency
K. Vendor Deficiency
L. Data/Information Needs Improvement /Less Than Adequate
M. Technical Proficiency Deficiency
N. Process/Task Design Deficiency